Space Weather Forecast

Issued on Monday, 25 April 2022 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of Moderate-class flares (R1/R2 Radio Blackouts), with a slight chance of Strong flares (R3 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low with only Common-class flares observed. There are now six sunspot regions on the disc, the largest and most prominent of these being two regions close together in the northwest of the disc. Both are large regions with some magnetic complexity, and as such these make up the majority of the flare risk at the present time. All other regions are smaller and simpler, although a region near north centre disc is showing signs of some magnetic complexity, and regions near the southeast limb have given some recent (non Earth directed) Coronal Mass Ejection (CME) activity. No Earth-directed CMEs have been observed in available imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has been largely unremarkable, although with slightly elevated wind speeds suggesting perhaps a weak connection to the fast wind of a coronal hole. Solar wind speeds have been mostly at slightly elevated levels, varying between 430-530 km/s. The Interplanetary Magnetic Field strength has been weak, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 0-2) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar Activity is currently Low, with a chance of reaching Moderate levels, most likely from the more complex regions in the northwest of the disc. There is a slight chance of this increasing to High due to an isolated Strong flare. The chances of a Moderate-class flare increase slightly through the period as further regions rotate onto the southeast limb.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on the 21st was forecast to pass Earth's orbit late on 24 April, with a slight chance of a glancing interaction. There remains a continuing but declining risk through the early part of Day 1 (25 Apr) that we may see a glancing blow from this feature. The current slightly elevated wind speeds may be due to a weak fast wind interaction with a coronal hole. Wind speeds are likely to slowly fall back to slow levels later on Day 1 and into Day 2 (25-26 Apr). No further sources of enhancement are expected at the current time.
Geomagnetic activity is forecast to be mostly Quiet to Unsettled through this period. There is a chance of Active intervals, with a very slight chance of a G1/Minor Storm interval, in the event of any CME interaction on Day 1.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels with no solar radiation storms occurring. However, there is a slight chance of solar radiation storms, as the complex sunspot regions in the northwest of the visible disc are now in a position where any energetic particles that can be released during larger flares may reach Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	50	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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